# Enhancement of the Compact INMS for Cold Ion Drifts, Neutral Winds and Temperatures

Completed Technology Project (2016 - 2017)

## Project Introduction

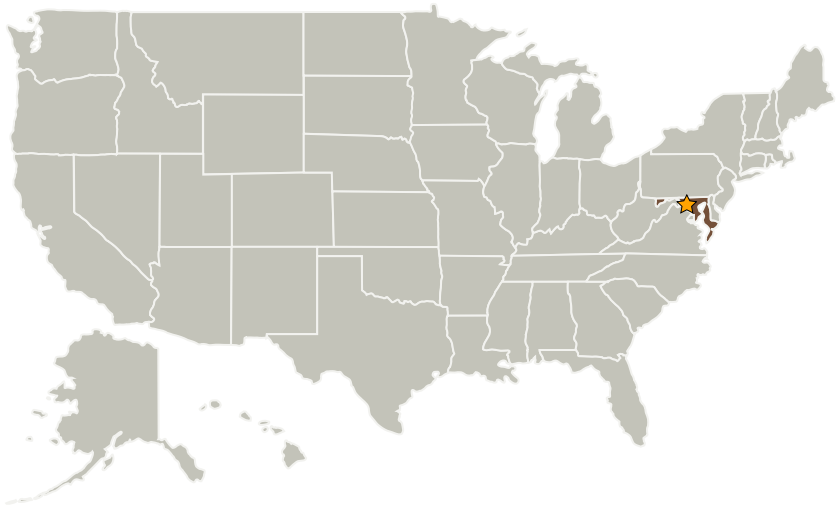
The proposed work implements an enhancement of the INMS to enable high-resolution ion and neutral temperature and drift/wind measurements. This enhanced capability is achieved primarily with a fine angular measurement of the particle velocity distribution function.

This technology development and maturation project extensively leverages design work completed through FY16 IRAD, building on the existing wide-angle mass spectrometer, which has a 360-degree field of view. The enhanced design provides angular resolution of the particle distributions and along-track ion velocity.

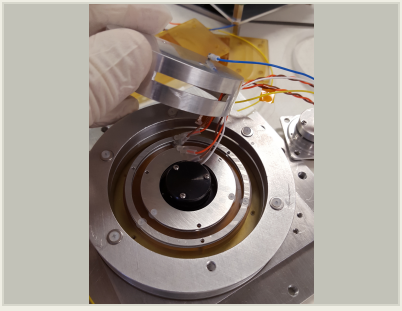
## Anticipated Benefits

The design serves as a foundation for further development, e.g. increased energy and mass resolution and velocity measurements.

## Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Goddard Space Flight Center(GSFC) | Lead Organization | NASA Center | Greenbelt, Maryland |



analyzer

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**Center Independent Research & Development: GSFC IRAD**

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| Primary U.S. Work Locations |
| --- |
| Maryland |

## Project Transitions

**October 2016:** Project Start

**September 2017:** Closed out

**Closeout Summary:** The purpose of the Goddard Space Flight Center's Internal Research and Development (IRAD) program is to support new technology development and to address scientific challenges. Each year, Principal Investigators (PIs) submit IRAD proposals and compete for funding for their development projects. Goddard's IRAD program supports eight Lines of Business: Astrophysics; Communications and Navigation; Cross-Cutting Technology and Capabilities; Earth Science; Heliophysics; Planetary Science; Science Small Satellites Technology; and Suborbital Platforms and Range Services.Task progress is evaluated twice a year at the Mid-term IRAD review and the end of the year. When the funding period has ended, the PIs compete again for IRAD funding or seek new sources of development and research funding or agree to external partnerships and collaborations. In some cases, when the development work has reached the appropriate Technology Readiness Level (TRL) level, the product is integrated into an actual NASA mission or used to support other government agencies. The technology may also be licensed out to the industry.The completion of a project does not necessarily indicate that the development work has stopped. The work could potentially continue in the future as a follow-on IRAD; or used in collaboration or partnership with Academia, Industry and other Government Agencies.If you are interested in partnering with NASA, see the TechPort Partnerships documentation available on the TechPort Help tab. http://techport.nasa.gov/help

## Organizational Responsibility

**Responsible Mission Directorate:**

Mission Support Directorate (MSD)

**Lead Center / Facility:**

Goddard Space Flight Center (GSFC)

**Responsible Program:**

Center Independent Research & Development: GSFC IRAD

## Project Management

**Program Manager:**

Peter M Hughes

**Project Managers:**

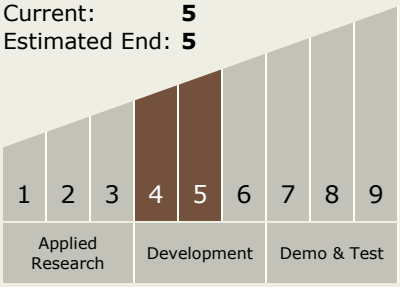
Nikolaos Paschalidis
Timothy C Gehringer

**Principal Investigator:**

Sarah L Jones

## Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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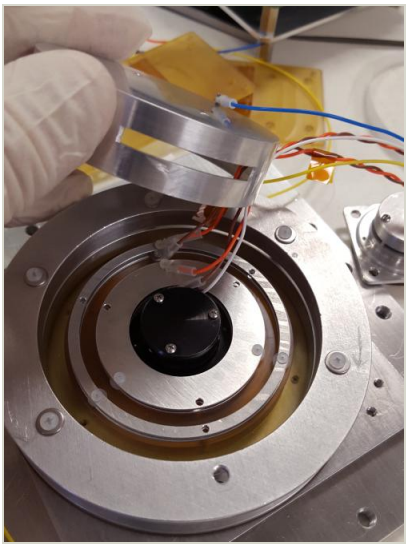
## Images



**Analyzer**
analyzer
*(https://techport.nasa.gov/image/26130)*

## Project Website:

http://sciences.gsfc.nasa.gov/sed/

## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.1 Field and Particle Detectors

## Target Destination

Earth